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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/829,598

04/22/2004

Jason A. Graetz

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7590

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GREENLEE WINNER AND SULLIVAN P C

4875 PEARL EAST CIRCLE

SUITE 200

BOULDER, CO 80301

EXAMINER

HODGE, ROBERT W

ART UNIT

PAPER NUMBER

1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/829,598	Applicant(s) GRAETZ ET AL.	
	Examiner ROBERT HODGE	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 19-40 and 46-50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 41-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/2/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments, see Remarks, filed 3/24/08, with respect to the rejection(s) of claim(s) 1-7 and 13-18 under 35 U.S.C. 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. 4,346,152 in view of WO 01/96847. Applicants have amended claim 1 to now recite that $0 < z < 1$ instead of $0 < z \leq 1$, therefore z can no longer be equal to 1, which would remove the presence of silicon and this amendment necessitates the new grounds of rejection below as well as the addition of the newly added claims.

Election/Restrictions

Newly submitted claims 30-39 and 46-50 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Independent claims 30 and 46 recite a nanofilm or nanostructured material comprising germanium or germanium alkali metal alloy which is a different species than originally presented.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 30-39 and 46-50 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 11/2/07 has been considered by the examiner.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 42 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicants direct the Examiner to paragraphs 14, 73 and 91 of the instant disclosure for support of newly added claim 42. However no support can be found for the recitation of “electrochemically alloying an alkali metal with a contiguous silicon-germanium nanofilm”. The only process that the Examiner can find support for is vapor deposition which is not an electrochemically alloying process, it is a coating process.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-7, 11-18, 41, and 42 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,346,152 hereinafter Sammels in view of WO 01/96847 hereinafter Zhou.

Sammels teaches an electrode for a secondary electrochemical cell comprising a contiguous lithium-germanium-silicon alloy having the formula $\text{Li}_a\text{Ge}_b\text{Si}_c$ wherein $0 < a \leq 4.4$, $0.02 \leq b \leq 0.05$ and $c = 1$ (column 3, line 55 – column 4, line 53).

Sammels does not teach an alloy that is nanostructured.

Zhou teaches an electrode for a secondary electrochemical cell comprising a nanostructured alkali metal alloy, such as a lithium metal alloy containing Germanium, wherein the nanostructured material can be nanoparticles having a diameter between 1-50 nanometers or a nanofilm that is coated onto a current collector and a binder is present (see pages 3, 5 and 6).

At the time of the invention it would have been obvious to one having ordinary skill in the art to optimize the alloy structure size of Sammels as taught by Zhou in order to provide a secondary electrochemical cell electrode having a high capacity, increased cyclability and that has improved stability thus increasing the overall life of the secondary electrochemical cell and also since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art, in the absence of unexpected results. In re Boesch, 617 E.2d 272, 205 USPQ 215 (CCPA 1980). The Examiner notes that Sammels discloses the subscript for Si to be 1 which is very close to applicants claimed range especially as the range for z approaches zero (making the subscript for Si approach 1) and therefore it is the position of the Examiner

that Sammels as modified by Zhou will have substantially similar properties to the instantly claimed invention and the burden is shifted to applicants to prove in the form of evidence otherwise.

The Examiner also notes that Sammels as modified by Zhou is capable of the functional language recited in claims 13-15.

The Examiner further notes that claim 42 is a product-by-process claim. "Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps". See MPEP § 2113. Therefore because all of the structure recited in claim 42 is present in the Sammels as modified by Zhou, claim 42 is included in the above 103(a) rejection.

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sammels in view of Zhou as applied to claim 1 above, and further in view of U.S. Pre-Grant Publication No. 2004/0106741 hereinafter Kriesel.

Sammels as modified by Zhou does not teach the specific thickness of the nanofilm, but does teach that the size of the particles used in the film, which when used as a coating such as in Zhou would form a very thin nanofilm.

Kriesel teaches that the thickness of nanofilms can be formed in a range of 1-30 nanometers (paragraphs [0018] and [0191]).

At the time of the invention it would have been obvious to one having ordinary skill in the art to optimize the thickness of the nanofilm of Sammels as modified by Zhou in a range of 1-30 nanometers as taught by Kriesel in order to provide an electrode that has an increased capacity without increasing the overall size of the secondary

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electrochemical cell that the electrode will be used in and also since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art, in the absence of unexpected results. In re Boesch, 617 E.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sammels in view of Zhou as applied to claim 1 above, and further in view of WO 03/073535 (U.S. Pre-Grant Publication No. 20040258997 is used as the English Equivalent) hereinafter Utsugi.

Sammels as modified by Zhou does not teach a conductive diluent.

Utsugi teaches an electrode for a secondary battery wherein the electrode comprises a conductive diluent such as carbon black in addition to a binder (abstract and paragraph [0047]).

At the time of the invention it would have been obvious to one having ordinary skill in the art to provide a conductive diluent such as carbon black in the electrode of Sammels as modified by Zhou as taught by Utsugi in order to provide an electrode that has increased conductivity thus improving the overall performance of the battery. The Examiner notes that because carbon black is one of the preferred materials of the instant invention as outlined in the instant disclosure it will inherently be capable of alloying with the alkali metal (lithium) of Sammels as modified by Zhou.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **ROBERT HODGE** whose telephone number is (571)272-2097. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. H./

Examiner, Art Unit 1795

/Jonathan Crepeau/

Primary Examiner, Art Unit 1795